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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/527,162	03/17/2000	Daniel M. Joffe	N-4717	2974
23456	7590	02/17/2004	EXAMINER	
WADDEY & PATTERSON 414 UNION STREET, SUITE 2020 BANK OF AMERICA PLAZA NASHVILLE, TN 37219			LIU, SHUWANG	
			ART UNIT	PAPER NUMBER
			2634	

DATE MAILED: 02/17/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 09/527,162	Applicant(s) JOFFE ET AL.	
	Examiner Shuwang Liu	Art Unit 2634	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 March 2000.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 22, 24 and 25 is/are allowed.
- 6) ☒ Claim(s) 1, 2, 5-18, 21, 23, 26 and 27 is/are rejected.
- 7) ☒ Claim(s) 3, 4, 19 and 20 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All   b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                  | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>3</u> . | 6) <input type="checkbox"/> Other: _____                                    |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 1, 2, 5-18, 21, 23, 26 and 27 are rejected under 35 U.S.C. 102(e) as being anticipated by Dowling (US 6,522,688).

As shown in figure 3A, Dowling discloses;

(1) regarding claims 1 and 23:

a data communications system using a power feeding arrangement with a coupling transformer (inside 305) having an equipment side winding (see 310, 315,... 355) and a line side winding (137), an apparatus for reducing signal distortion caused by a flux imbalance associated with the transformer comprising:

a distortion monitoring circuit (310, 315, 320 and 325) having a monitoring input coupled to the equipment side winding (inside 305) of the coupling transformer and operative to generate at an error output an error signal (output from 325) corresponding to measurements of the signal distortion sampled (by 315) by the monitoring circuit;

a flux controller (335) having a control input in electrical communication with the error output (output from 325) of the distortion monitoring circuit and operative to generate at a control output a flux cancellation signal (output from 335) in response to the error signal; and

a flux generator (345, 350, 325, 355 and an amplifier inside 305) having a first generator input (output from 335) in electrical communication with the control output of the flux controller (335) and a generator output (output from 355) in electrical communication with the equipment side winding of the coupling transformer (see inside 305), the flux generator responsive to the flux cancellation signal (output from 335) to generate a cancellation flux (output from 345) to reduce the flux imbalance (column 17, line 7-column 20, line 37).

(2) regarding claim 2:

wherein the distortion monitoring circuit comprises an echo canceller (325).

(3) regarding claim 5:

wherein the flux generator comprises a signal summer (345) having a second input (output from 340) connected to a transmit signal (output from 340).

(4) regarding claim 6:

wherein the signal summer is a digital summer and the flux generator further comprises a digital to analog converter (350) connected between the digital summer and an analog filter (355).

(5) regarding claim 7:

wherein the flux generator further comprises a line driver circuit (amplifier inside 305) operatively connected between the analog filter (355) and the equipment side winding of the coupling transformer.

(6) regarding claim 8:

wherein the line driver circuit comprises an amplifier (see inside 305).

(7) regarding claim 9:

wherein the distortion monitoring circuit and flux controller are operative to measure a plurality of samples of the signal distortion and to vary the error signal and flux cancellation signal in response to measured changes in the samples of the distortion signal (column 17, line 7-column 20, line 37).

(8) regarding claim 10:

A flux imbalance compensator for a data communication system having a transmit signal and a coupling transformer (see inside 305) with an associated flux imbalance, the compensator comprising:

a signal quality monitor circuit (310, 315, 320 and 325) electrically connected to the transformer and operative to detect the flux imbalance associated with the transformer and to generate a detected quality signal (output from 325);

a flux cancellation signal generator (345, 350, 325, 355 and an amplifier inside 305) electrically connected to the signal quality monitor circuit and operative to receive the detected quality signal and generate a flux cancellation signal in response thereto;

a signal summer (345) for generating a transformer signal by combining the input data signal and the flux cancellation signal (output from 335); and

a line driver circuit (the amplifier inside 305) coupled to the transformer for receiving the transformer signal and generating a cancellation flux to reduce the flux imbalance (column 17, line 7-column 20, line 37).

(9) regarding claim 11:

the line driver circuit comprising an amplifier (inside 305) connected between the signal summer and the flux generator for amplifying the transformer signal.

(10) regarding claim 12:

further comprising an analog filter (355) operatively connected between the signal summer and the line driver circuit.

(11) regarding claim 13:

the signal quality monitor including an analog canceller (310).

(12) regarding claim 14:

wherein:

the transmitter signal comprises a digital transmit signal (output from 340);

the signal summer (345) includes a digital signal summer for receiving and combining a digital cancellation signal (output from 335) and the digital transmit signal

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to create a combined digital signal (output from 345), and a digital to analog converter to convert (350) the combined digital signal into the transformer signal;

the signal quality monitor includes an analog to digital converter (315) connected to a digital echo canceller (325) and operative to convert the transformer signal (input of 310) from analog to digital format, the digital echo canceller also connected to the digital input data signal (output from 340), wherein the signal quality monitor monitors the transformer signal and the digital transmit signal to produce the detected quality signal (output from 325) including a digital detected quality signal as an output of the digital echo canceller (column 17, line 7-column 20, line 37); and

the cancellation signal generator processes the digital detected quality signal to generate the cancellation signal including the digital cancellation signal (output from 325) (column 17, line 7-column 20, line 37).

(13) regarding claim 15:

A circuit associated with a data transmission system for reducing a flux imbalance associated with a transmit signal (output from 340) sent through a power feeding transformer (inside 305) comprising:

an echo canceller (325) for generating a canceller error signal (output from 325);

a flux controller (335) in electrical communication with the echo canceller and operative to monitor the canceller error signal and to generate a responsive flux canceller signal (output from 335);

a signal combiner (345) for summing the transmit signal with the flux canceller signal to form a transformer input signal (output from 345); and

a winding (see inside 305) in the transformer for receiving the transformer input signal and generating a flux (input to the amplifier inside 305 on the receiving path) to reduce the flux imbalance (column 17, line 7-column 20, line 37).

(14) regarding claim 16:

further comprising a signal amplifier (see inside 305) electrically connected between the signal combiner (345) and the winding.

(15) regarding claim 17:

further comprising an analog filter (355) electrically connected between the signal combiner and the signal amplifier.

(16) regarding claim 18:

further comprising a digital to analog converter (350) electrically connected between the analog filter (355) and the signal combiner (345).

(17) regarding claim 21:

wherein the echo canceller includes a digital echo canceller (325).

(18) regarding claims 26 and 27:

In a simplex power arrangement of a data communications system having a transceiver (300) with a transmit signal (output from 340) and further having an echo canceller (325) providing an error signal (output from 325) responsive to nonlinearities caused by flux imbalance in a coupling transformer, an apparatus comprising:

a flux controller (335) for generating a flux canceller signal (output from 335) in response to the error signal and in accordance with a flux cancellation algorithm;



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a signal summer (345) for combining the transmit signal and the flux canceller signal; and

an amplifier (see inside 305) coupled to the summer, the amplifier providing an output signal to a winding on a transceiver side of the transformer (column 17, line 7-column 20, line 37).

***Allowable Subject Matter***

3. Claims 22, 24 and 25 are allowed.
4. Claims 3, 4, 19 and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
5. The following is a statement of reasons for the indication of allowable subject matter: the prior art fails to teach and suggest the apparatus comprising the echo canceller including an analog echo canceller and equalizer as recited in claims and repeating the steps of measuring, modifying, generating, and combining until the measured signal quality reaches a pre-determined threshold as recited in claim 22.

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**Conclusion**

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shuwang Liu whose telephone number is (703) 308-9556.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin, can be reached at (703) 305-4714.

**Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C. 20231

**or faxed to:**

**(703) 872-9306 (for Technology Center 2600 only)**

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.



Shuwang Liu  
Primary Examiner  
Art Unit 2634

November 24, 2003